Polygons
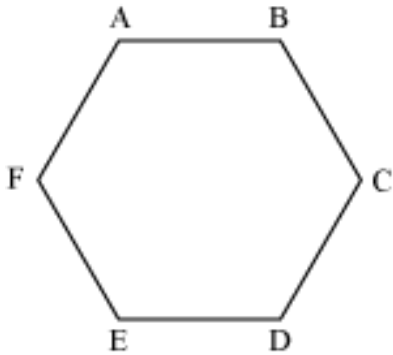
- A **polygon** is a simple closed curve made up of line segments. ABCDEF is a polygon.
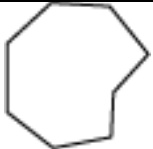

The attributes with respect to polygon ABCDEF are:

1. The line segments AB, BC, CD, DE, EF, and FA are known as the **sides of the polygon** ABCDEF.
2. Any two sides with common end points are called **adjacent sides**. AB and BC are adjacent sides with common end point B.
3. The meeting point of a pair of sides of a polygon is known as **vertex**. In the polygon ABCDEF, sides AB and BC meets at point B. So, point B is called the vertex of the polygon. Similarly, the other vertices are A, C, D, E, and F.
4. The line joining any two non-adjacent vertices of a polygon is known as its **diagonal**.
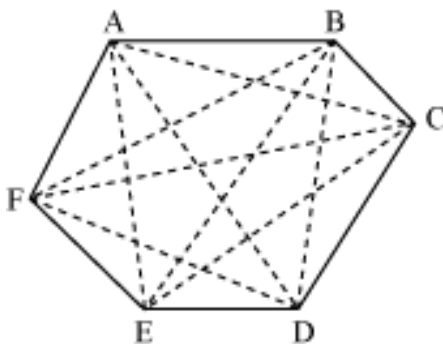
In the polygon ABCDEF, the diagonals are AC, AD, AE, BD, BE, BF, CE, CF, and DF.

- A polygon's name is based on the number of its sides.

Number of sides	Figure	Name
3		Triangle
4		Quadrilateral
5		Pentagon
6		Hexagon
8		Octagon

- The sum of all the interior angles of an n-sided polygon is given by, $(n-2) \times 180°$.

  Example: What is the number of sides of a polygon whose sum of all interior angles is 720°?

  Solution: It is known that,

  $(n-2)180° = 720°$
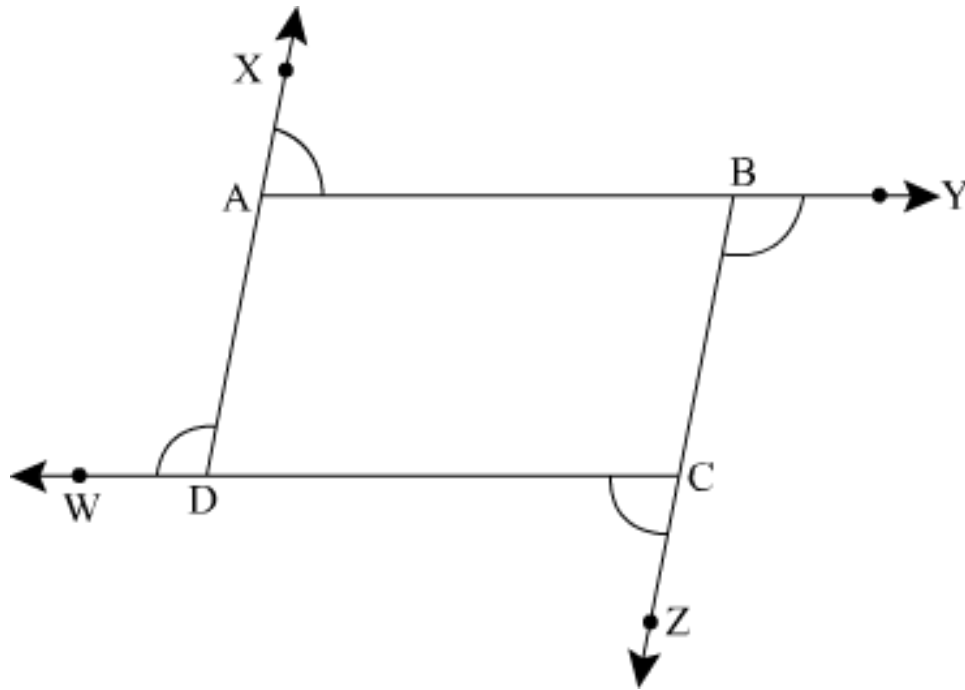
  $\Rightarrow (n-2) = \dfrac{720°}{180°} = 4$

  $\Rightarrow n = 6$

  Thus, the required polygon is six-sided.

- The sum of measures of all exterior angles of a polygon is 360°.

For example, in the quadrilateral given below,
∠XAB + ∠YBC + ∠ZCD + ∠WDA = 360°

- A polygon, which is both equiangular and equilateral, is called a **regular polygon.** Otherwise, it is an **irregular polygon.**

  Example: Square is a regular polygon but rectangle is an irregular polygon.